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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SUTHERS, DOUGLAS JOHN

ART UNIT

PAPER NUMBER

2644

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,521	VIERTHALER ET AL.	
	Examiner	Art Unit	
	Douglas Suthers	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-21, 24, 26 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 22, 23, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>02/26/01, 04/01/02</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Low pass filter 210 is referenced several times. The first being page 28 line 8. However figure 2 does not contain a reference number 210, but 202 instead. Perhaps the reference number 202 on the drawing is to be 210. Page 30 line 2 refers to nonlinear circuit 108 in reference to figure 3, although no 108 is found. Perhaps applicant meant nonlinear circuit 308. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 2 shows reference P1 not crossed out as in other drawings. Applicant is reminded to do so. Corrected drawing sheets in compliance with 37 CFR

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1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to because in Figure 4 reference number 408 points to a dotted line box already referenced as 302. Perhaps applicant meant to have 408 designate the solid line box. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

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"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: Page 31 talks of referring to items 302 and 304 of figure 4 as 402 and 404 respectively for the remainder of the specification. It is strongly discouraged to do so due to the fact that there is already a multiplier 402 and there is no apparent need.

Appropriate correction is required.

Claim Objections

5. Claim 27 is objected to because of the following informalities: Claim 27 refers to "an output connected to said second function generator control input" in the last line. No previous control input is mentioned for the second function generator. The following would be consistent with the disclosure and is assumed for this office action: "an output connected to said second nonlinear circuit control input". Appropriate correction is required.

Claim Rejections - 35 USC § 103

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 13-21, 24-26, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackmer (US 4182930) in view of Smith et al (US 4000370).

8. Regarding claim 13, Blackmer discloses a method for processing a received audio signal comprising: band-limiting the received audio signal to generate a first intermediate signal (38); multiplying said first intermediate signal by a correction factor to generate a second intermediate signal (24); amplifying said second intermediate signal by an amplification factor to generate a third intermediate signal (52); band-limiting said third intermediate signal to generate a fourth intermediate signal (54); and adding said fourth intermediate signal to said received audio signal (20B).

Blackmer does not expressly disclose the use of a limiter.

Smith discloses the use of a limiter, limiting (22) the amplitude of an audio signal to a specified maximum value to generate a limited signal (column 1 lines 38-41).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the limiter of Smith to limit the third signal. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 13.

9. Regarding claim 14, the method of claim 13 is disclosed as above.

Smith discloses further comprise: adjusting a correction factor (gain from 28 to 30) based on a signal exceeds a predetermined threshold value (column 2 lines 22-29, figure 3).

10. Regarding claims 15-16, the method of claim 14 is disclosed as above.

Smith discloses further comprising: reducing said correction factor when said third intermediate signal exceeds said predetermined threshold value (figure 3 above 100 DB), and increasing said correction factor when said third intermediate signal does not exceed said predetermined threshold value (figure 3 below 100 DB).

11. Regarding claims 17-18, the method of claim 14 is disclosed as above.

Blackmer discloses wherein said adjusting said correction factor comprises: generating a control variable based on an amplitude (46), and generating said correction factor (signal from 46) as a function of said control variable and wherein said generating a correction factor as a function of said control variable is performed by a low-pass filter (48). Although Blackmer does not disclose that the amplitude of the third signal is used to generate the control variable, the amplitude detected by level detector 48 would be a function of the third signal. Therefore it would be obvious to one of ordinary skill in the art that it could be based on the third signal.

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12. Regarding claims 19-20, the method of claim 13 is disclosed as above.

Blackmer discloses wherein said limiting the amplitude of said third intermediate signal to a specified maximum value comprises: generating harmonics of low-frequency signal components of said received audio signal (unit 14); and weighting said harmonics with a variable factor; wherein said weighting said harmonics with a variable factor comprises: generating said variable factor as a function of said third intermediate signal (responsive to signal energy, column 2 lines 46-51).

13. Regarding claim 21, the method of claim 20 is disclosed as above.

Blackmer discloses wherein said step of generating harmonics comprises: increasingly generating harmonics at the beginning of a low-frequency signal. If there were no low-frequency signal the control from 26 would be low. As low-frequency power increased, the signal would increase, increasing the gain of amplifier 24.

14. Regarding claim 24, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit to provide at an output of the circuit a processed audio signal, the circuit comprising: a first adder (20B) having first and second inputs and an output at which the processed audio signal is provided; a first conductive path (from 30B to 20B) connecting the circuit input to said first input of said first adder, said first conductive path constructed and arranged to deliver said received audio signal unaltered to said first adder; a second conductive path (from 30B to 34 to 20B) connecting said circuit input to said second input of said first adder, said second

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conductive path comprising: a first bandpass filter (38) having an output and an input connected to said circuit input; a multiplier (24) having a first input connected to said first bandpass filter output, and a second input, and an output; a variable amplifier (52), having an output and an input connected to said multiplier output, for amplifying a signal received at said amplifier input in accordance with an amplification factor presented at a control input of said amplifier; and a second bandpass filter (54) having an input connected to said nonlinear circuit output and an output defining said circuit network output; and a first function generator (50) having an input connected to a control output of a nonlinear circuit (48), and an output connected to said multiplier (24) second input.

Blackmer does not expressly disclose the use of the non-linear circuit and function generator.

Smith discloses a nonlinear circuit limiting to a specified maximum the amplitude of a signal presented at the nonlinear circuit input (column 2 lines 22-29, figure 3) and a function generator (22, gain function of figure 3) having an input connected to a control output of said first nonlinear circuit, and an output connected to a multiplier input.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the non-linear circuit of Blackmer with the limiter of Smith. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 24.

15. Regarding claim 25, the circuit arrangement of claim 24 is disclosed as above.

Blackmer discloses wherein said first function generator comprises a first low-pass filter (48).

16. Regarding claim 26, the circuit arrangement of claim 24 is disclosed as above.

Blackmer does not disclose a second non-linear circuit. However the only difference between the non-linear circuit of claim 24 and the combination of both nonlinear circuits of claim 26 is that the nonlinear circuits are dependent on an additional function of their input. It is well known in the art that limiters may limit signal signals based on a plurality of measurements, positive and negative voltage for example. Therefore it would be obvious to have the first nonlinear circuit comprise: a second nonlinear circuit having an input and output connected to said input and output, respectively, of said first nonlinear circuit, a control output defining said control output of said first nonlinear circuit, and a control input to which said second nonlinear circuit is responsive; and a second function generator having an input connected to said input of said first nonlinear circuit and an output connected to said control input of said second nonlinear circuit.

17. Regarding claim 29, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit to provide at an output of the circuit a processed audio signal, the circuit comprising: means for band-limiting (38) the received audio signal to generate a first intermediate signal; means for multiplying (24) the first intermediate signal by a correction factor to generate a second intermediate signal;

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means for amplifying (52) the second intermediate signal by an amplification factor to generate a third intermediate signal; means for band-limiting said third intermediate signal to generate a fourth intermediate signal (54); and means for adding said fourth intermediate signal to said received audio signal (20B).

Blackmer does not expressly disclose a limiting means.

Smith discloses a means for limiting (22) the amplitude of an audio signal to a specified maximum value to generate an intermediate signal (column 2 lines 22-29).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to limit the amplitude of the third signal of Blackmer with the limiter of Smith. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 29.

18. Regarding claim 30, the circuit of claim 29 is disclosed as above.

Smith discloses further comprising: a means for adjusting a correction factor (gain from 28 to 30) based on whether said third intermediate signal exceeds a predetermined threshold value (figure 3 above 100 DB).

19. Regarding claim 31, the circuit of claim 30 is disclosed as above.

Smith discloses further comprising: means for reducing a correction factor when the signal exceeds said predetermined threshold value (figure 3 above 100 DB), and for

increasing a correction factor when the signal does not exceed said predetermined threshold value (figure 3 below 100 DB).

20. Regarding claim 32, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit (10B) to provide at an output of the circuit a processed audio signal (after 20B), the circuit comprising: a first conductive path through which the received audio signal travels (from 30B to 20B); a second conductive path through which the received audio signal travels (from 30B to 34 to 20B), wherein the audio signal is processed such that harmonics of the signal components with a low-frequency are generated in the second path and are admixed to the signal in the first path, wherein in the second path the audio signal is sequentially bandpass filtered (38), weighted with a correction factor (24), amplified (52), and bandpass filtered (54).

Blackmer does not expressly disclose the use of a limiter.

Smith discloses wherein an audio signal is limited to a maximum value (column 2 lines 22-29), and wherein the correction factor (gain from 28 to 30) is reduced when the maximum value is exceeded (column 2 lines 22-29. figure 3 above 100 DB).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the limiter of Smith in the circuit of Blackmer. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 32.

Allowable Subject Matter

21. Claims 22-23, and 27-28 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter: These claims teach control of an audio circuit that adds low frequency harmonics, the control of which includes a peak detector that's signal is low pass filtered through two low pass filters in parallel, and subtracted from each other. Similar circuits in the state of the art such as Waller, Jr. (US 4696044), Williamson, III (US 5369711), and Watanabe (US 4790014) do not teach such.

Conclusion

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas Suthers whose telephone number is (571)272-0563. The examiner can normally be reached on 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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